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EXAMINER	
KEEHN, RICHARD G	

ART UNIT	PAPER NUMBER
2152	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/699,913	BO ET AL.	
	Examiner	Art Unit	
	Richard G. Keehn	2152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/5/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-17 have been examined and are pending.

Information Disclosure Statement

1. The information disclosure statement filed 02/05/2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. Applicant has only submitted first pages of the cited references instead of each page of each reference to be considered. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process*

Control Corp. v. HydReclaim Corp., 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "forbidden" in claims 3 and 6 is used by the claims, based on Applicant's specification, Page 6, lines 5-7, to mean "when the required GOV fails to be found," while the accepted meaning of "forbidden" is "something that is off-limits." The term is indefinite because the specification does not clearly redefine the term. Furthermore, the term is used inconsistently. In Claim 6, "forbid" reflects the accepted meaning in the art, that is data that is "off-limits" such as parental guidance type screening, while in Claim 3 it does not. In Claim 3, the term "forbidden" reflects "when the required GOV fails to be found" as stated in the specification. This renders the term "forbidden" indefinite. Applicant is required to use the term consistently.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 3-4 and 7-14 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by US 2002/0047899 A1 (Son et al.).

As to Claim 1, Son et al. anticipate an MPEG-4 live unicast video streaming system for use in a wireless network including an end-to-end congestion control mechanism that can automatically and dynamically adjust a data-bitrate/transmission bitrate according to an available network bandwidth, the system comprising:

(1) a rate adaptive MPEG-4 simple profile encoder for generating MPEG-4 simple profile live video data (Son et al. - ¶ [0072] recites live video using MPEG-4 in a network; [0036] recites the encoding of the data) through an encoding process with an adjustable encoding bitrate (Son et al. – ¶ [0032] recites the variable bitrate), for transmitting the generated MPEG-4 simple profile live video data by HTTP/TCP through a LAN (Son et al. – ¶ [0045] recites http), and for adjusting the encoding bitrate in accordance with a bitrate control requirement (Son et al. – ¶ [0032] recites the variable bitrate);

(2) a streaming server (Son et al. - ¶ [0044] recites the streaming server);

(2a) a data receiver module provided in the streaming server for receiving the MPEG-4 simple profile live video data by HTTP/TCP from the rate adaptive MPEG-4 simple profile encoder through the LAN (Son et al. - Figure 1. item 102 recites the stream caching server);

(2b) an RTSP server module provided in the streaming server for handling a streaming session (Son et al. – ¶ [0046- 0047] recite the packet processor which processes RTSP) ;

(2c) an RTP/RTCP transport engine server module provided in the streaming server for segmentizing the MPEG-4 simple profile live video data received by the data

receiver module on the basis of GOVs, for packetizing each GOV as payload of RTP packets, and for transmitting the RTP packets through a wireless network according to a bitrate of each GOV, whereas RTCP is implemented for transporting retransmission request and reply (Son et al. - ¶ [0050] recites the transcoding based upon a group of video objects for formatting, play rates, and type of conversion and handheld devices; ¶ [0051] recites using RTP packets);

(2d) a bitrate adapter module provided in the streaming server for implementing a bitrate adaptation protocol and a network bandwidth polling protocol to allow the streaming server to proceed with bitrate control tasks, and forwarding an incoming bitrate control decision to the rate adaptive MPEG-4 simple profile encoder as the bitrate control requirement (Son et al. – ¶ [0032] recites variable bit rate control within the stream caching server; Page 4, ¶ [0048] recites the polling to determine bandwidth);

(2e) a data link buffer provided in the streaming server for storing the MPEG-4 simple profile live video data received by the data receiver module as MPEG-4 GOV data (Son et al. – Figure 1, item 146 recites a buffer provided in the streaming server);

(3) a client (Son et al. – Figure 1, item 116 recites a client);

(3a) a rate adaptive MPEG-4 simple profile decoder provided in the client for decoding received MPEG-4 GOV data and rendering pictures represented by the received MPEG-4 GOV data (Son et al. – ¶ [0072] recites the client decoding incoming encoded data from the server discussed in the previous limitions, hence protocol is the same as sent from the server);

(3b) an RTSP client module provided in the client for handling the streaming session (Son et al. – ¶ [0072] recites the client decoding incoming encoded data from the server discussed in the previous limitations, hence protocol is the same as sent from the server);

(3c) an RTP/RTCP transport engine client module provided in the client for receiving the RTP packets from the streaming server through the wireless network, for depacketizing and desegmentizing the payload of the received RTP packets to each GOV of MPEG-4 GOV data, whereas RTCP is implemented for transporting retransmission request and reply (Son et al. – ¶ [0072] recites the client decoding incoming encoded data from the server discussed in the previous limitations, hence protocol is the same as sent from the server; ¶ [0053] recites the RTCP streams from server to "many subscribers" i.e. clients; Figures 2A and 2B recite the packetization and segmentation techniques used in the TCP));

(3d) a bitrate adapter module provided in the client for implementing the bitrate adaptation protocol and the network bandwidth polling protocol to allow the client to proceed with bitrate control tasks, and for forwarding the bitrate control decision to the streaming server (Son et al. – ¶ [0048] and ¶ [0050] recite bandwidth detection and bit rate adjustment by the system components based on available bandwidth); and

(3e) a data link buffer provided in the client for storing the MPEG-4 GOV data generated by the RTP/RTCP transport engine client module, for collecting bitrate control information, and for forwarding the collected bitrate control information to the bitrate

adapter module in the client (Son et al. – Figure 1, item 152 recites a buffer within the client).

As to Claim 3, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 1, wherein the RTP/RTCP transport engine server module comprises:

means for segmentizing and packetizing each GOV into RTP packets and then packing one RTP packet as payload of one UDP packet, and for pushing the UDP packet to the client through the wireless network according to a data bitrate (Son et al. – Figures 2A and 2B recite segmentizing and packetizing of GOV into RTP packets as payload in a UDP packet; Page 3, ¶ [0032] recites the variable bitrate; and Page 3, ¶ [0031-0032] recite the client receiving metadata, including bit rate information, from the server);

means for receiving a retransmission request from the client through a UDP connection which loads an RTCP packet with information representative of the retransmission request (Son et al. - Page 5, ¶ [0053] recites the error detection of GOV data and retransmission of missing data);

means for, upon receiving the retransmission request, searching the data link buffer in the streaming server for a required GOV (Son et al. - Page 5, ¶ [0055] recites the searching method of the server's buffer);

means for, when the required GOV is found, retransmitting at least a portion of the required GOV which contains required data to the client using RTP packets (Son et

al. - Page 5, ¶ [0053] recites the error detection of GOV data and retransmission of missing data); and

means for, when the required GOV fails to be found, returning a negative acknowledgement of forbidden-retransmission to the client through an RTCP channel (Son et al.—Page 3, ¶ [0033] recites restriction information in the metadata).

As to Claim 4, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 1, wherein the bitrate adapter module in the streaming server comprises:

means for receiving the bitrate control information from the client as the bitrate control decision and proceeding with bandwidth polling with cooperation of the client (Page 4, ¶ [0048] recites the polling to determine bandwidth using an automatic negotiating process of soliciting bitrates from the client until one is accepted); and

means for forwarding the bitrate control decision to the rate adaptive MPEG-4 simple profile encoder as the bitrate control requirement (Son et al. – Page 3, ¶ [0031-0032] recite the client receiving metadata, including bit rate information, from the server).

As to Claim 7, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 1, wherein the bitrate adapter module in the client comprises:

means for receiving the bitrate control information from the data link buffer in the client (Son et al. – Page 3, ¶ [0031-0032] recite the client receiving metadata, including bit rate information, from the server);

means for making the bitrate control decision in response to the received bitrate control information (Son et al.- Page 4, ¶ [0045] recites the client post-processing the content, which includes the metadata including bitrate information);

means for forwarding the bitrate control decision to the bitrate adapter module in the streaming server through a TCP connection (Son et al. – Page 3, ¶ [0031-0032] recite the client receiving metadata, including bit rate information, from the server; Page 5, ¶ [0053] recites the RTPC connection);

means for, according to the network bandwidth polling protocol, activating a polling process to work with the bitrate adapter module in the streaming server (Son et al. – ¶ [0032] recites variable bit rate control within the stream caching server; Page 4, ¶ [0048] recites the polling to determine bandwidth); and

means for initiating an auto-negotiation on an initial streaming bitrate between the streaming server and the client to work with the bitrate adapter module in the streaming server by using the network bandwidth polling protocol (Page 4, ¶ [0048] recites the polling to determine bandwidth using an automatic negotiating process of soliciting bitrates until one is accepted).

As to Claim 8, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 1, wherein each RTP packet has an extended structure

including additional fields defined for depacketization and desegmentation (Figures 2A and 2B recite the packetization and segmentation techniques).

As to Claim 9, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 3,

wherein the RTCP packet has a user application structure including additional fields defined for retransmission (Son et al. – Page 3, ¶ [0031-0032] recite the client receiving metadata, including bit rate information and user information such as the determination of genre, from the server).

As to Claim 10, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 1,

wherein each of the data link buffer in the streaming server and the data link buffer in the client stores a GOV in one GOV node with related information (Son et al. – Figure 1, items 146 and 152 recite the buffers).

As to Claim 11, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 1, further comprising

a retransmission mechanism for retransmitting data from the streaming server to the client, the retransmission mechanism including the data link buffer in the client, the RTP/RTCP transport engine client module, and the RTP/RTCP transport engine server

module (Son et al. – Page 5, ¶ [0053] recites the retransmission of blocks affected by errors).

As to Claim 12, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 1, further comprising

means provided in the bitrate adapter module in the streaming server and the bitrate adapter module in the client for implementing the network bandwidth polling protocol (Son et al. – ¶ [0032] recites variable bit rate control within the stream caching server; ¶ [0048] and ¶ [0050] recite bandwidth detection and bit rate adjustment by the system components based on available bandwidth).

As to Claim 13, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 1, further comprising

means provided in the data link buffer in the client, the bitrate adapter module in the streaming server, and the bitrate adapter module in the client for implementing the bitrate adaptation protocol (Son et al. – ¶ [0048] and ¶ [0050] recite bandwidth detection and bit rate adjustment by the system components based on available bandwidth; Figure 1, items 146 and 152 recite the buffers).

As to Claim 14, Son et al. anticipate an MPEG-4 live unicast video streaming system as recited in claim 13,

wherein the bitrate adaptation protocol includes a bitrate decision rule with implementation of a decision sliding window (Son et al. – Page 3, ¶ [0034] recites "changes in variable bit rate").

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0047899 A1 (Son et al.), and further in view of US 2003/0067981 A1 (Zhao et al.).

As to Claim 2, Son et al. discloses an invention substantially as claimed, including an MPEG-4 live unicast video streaming system as recited in claim 1, wherein the data link buffer in the streaming server comprises:

means for storing the MPEG-4 simple profile live video data as a link of GOVs with related information representative of parameters including a GOV bitrate, a GOV duration, and a GOV size (Son et al. - ¶ [0031-0032] recite metadata containing bitrate, length of play (duration) and size);

interfaces for inserting a GOV, reading out a GOV, and searching for a GOV (Son et al. – Page 5, ¶ [0053] recites inserting replacement GOV data retrieved after an error is detected; Figure 5B, items 520 and 530 recite the reading of GOV data; and Page 5, ¶ [0055] recites the searching method);

While Son et al. discloses lowering quality of content (Son et al. - Fig 5B, item 534), they do not explicitly disclose, but Zhao et al. disclose an invention substantially as claimed, including a means for, when a speed of GOV reading is slower than a speed of GOV inserting, allowing overwriting an old unread GOV with resynchronization

of read and write pointers by resetting a buffer status and dropping rest unread GOVs (Zhao et al. – Page 4, ¶ [0045] recites frame inserting and skipping to reduce bitrate).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine when a speed of GOV reading is slower than a speed of GOV inserting, allowing overwriting an old unread GOV with resynchronization of read and write pointers by resetting a buffer status and dropping rest unread GOVs taught by Zhao et al., with the reduction in quality of content, taught by Son et al.

One of ordinary skill in the art at the time the invention was made would have been motivated to reduce transmission size to fit over cellular networks and the like. (Zhao et al. – Page 2, ¶ [0015]).

As to Claim 6, Son et al. disclose an invention substantially as claimed, including an MPEG-4 live unicast video streaming system as recited in claim 1, wherein the RTP/RTCP transport engine client module comprises:

means for receiving the RTP packets by a UDP connection through the wireless network, and then desegmentizing and depacketizing the received RTP packets to each GOV (Figures 2A and 2B recite the packetization and segmentation techniques used);

means for receiving the retransmission request from the data link buffer in the client, and then forwarding the retransmission request to the RTP/RTCP transport engine server module through a UDP connection which loads an RTCP packet with information representative of the retransmission request (Son et al. – Page 5, ¶ [0053] recites retransmission to the client after an error is detected);

means for, upon receiving the retransmitted data, searching the data link buffer in the client for a specified GOV (Son et al. – Page 5, ¶ [0053] recites inserting replacement GOV data retrieved after an error is detected. Client receives the retransmitted GOV data and uses it);

means for, when the specified GOV is found, inserting the retransmitted data or a whole GOV containing the retransmitted data into its position in the data link buffer in the client (Son et al. – Page 5, ¶ [0053] recites inserting replacement GOV data retrieved after an error is detected. Client receives the retransmitted GOV data and uses it); and

means for setting a forbidden-retransmission flag of the specified GOV in the data link buffer in the client to forbid a further retransmission request when a forbidden-retransmission RTCP packet is received (Son et al. – Page 3, ¶ [0033] recites metadata including access right indication).

Son et al. do not explicitly disclose, but Zhao et al. disclose an invention substantially as claimed, including a means for inserting one of an incomplete GOV and a blank GOV into the data link buffer in the client upon occurrence of one of packet loss and packet out-of-sequence (Zhao et al. – Page 4, ¶ [0045] recites frame inserting and skipping to reduce bitrate; Son et al. – Page 5, ¶ [0053] recites the detection of errors);

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine a means for inserting one of an incomplete GOV and a blank GOV into the data link buffer in the client taught by Zhao et al., with the error recovery, taught by Son et al.

One of ordinary skill in the art at the time the invention was made would have been motivated to reduce transmission size to fit over cellular networks and the like. (Zhao et al. – Page 2, ¶ [0015]).

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0047899 A1 (Son et al.), and further in view of US 2003/0067981 A1 (Zhao et al.) and US 2002/0131496 A1 (Vasudevan et al.).

As to Claim 5, Son et al. disclose an invention substantially as claimed, including an MPEG-4 live unicast video streaming system as recited in claim 1, wherein the data link buffer in the client comprises:

interfaces for inserting a GOV, [*sic*], inserting data of an incomplete GOV, reading out a GOV, and searching for a GOV (Son et al. – Page 5, ¶ [0053] recite inserting missing data after detecting and retrieving said missing data; Page 5, ¶ [0055] recites the searching method; Figure 5B, items 520 and 530 recite the reading of GOV data);

means for storing the MPEG-4 simple profile live video data as a link of GOVs with related information representative of parameters including a GOV bitrate, a GOV duration, and a GOV size (Son et al.- Page 3, ¶ [0032] recites metadata containing bitrate, duration and size);

means for verifying an incomplete GOV and sending a retransmission request corresponding to the verified incomplete GOV to the RTP/RTCP transport engine client

module (Son et al. – Page 5, ¶ [0053] recite inserting missing data after detecting and retrieving said missing data); and

means for recovering a complete GOV corresponding to the incomplete GOV from retransmitted data (Son et al. – Page 5, ¶ [0053] recite inserting missing data after detecting and retrieving said missing data. Client uses retransmitted data).

Son et al. do not explicitly disclose, but Vasudevan et al. disclose an invention substantially as cliamed, including a means for collecting a current buffer status as the bitrate control information and sending the bitrate control information to the bitrate adapter module in the client (Vasudevan et al. – Page 6, ¶ [0050-0057] recite the calculation of playback based on buffer).

While Son et al. discloses lowering quality of content (Son et al. - Fig 5B, item 534), they do not explicitly disclose, but Zhao et al. disclose an invention substantially as claimed, including a inserting a blank GOV (Zhao et al. – Page 4, ¶ [0045] recites frame inserting and skipping to reduce bitrate); and

means for, when a speed of GOV reading is slower than a speed of GOV inserting, allowing overwriting an old unread GOV with resynchronization of read and write pointers by resetting a buffer status and dropping rest unread GOVs (Zhao et al. – Page 4, ¶ [0045] recites frame inserting and skipping to reduce bitrate);

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine inserting a GOV; and a means for, when a speed of GOV reading is slower than a speed of GOV inserting, allowing overwriting an old unread GOV with resynchronization of read and write pointers by resetting a buffer

status and dropping rest unread GOVs, taught by Zhao et al., with the reduction in quality of content, taught by Son et al.

One of ordinary skill in the art at the time the invention was made would have been motivated to reduce transmission size to fit over cellular networks and the like. (Zhao et al. – Page 2, ¶ [0015]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine a means for collecting a current buffer status as the bitrate control information and sending the bitrate control information to the bitrate adapter module in the client taught by Vasudevan et al., with the variable bit rate taught by Son et al.

One of ordinary skill in the art at the time the invention was made would have been motivated to provide a system and method to adaptively transcode predictive coded video data and associated audio data such that the data may be transmitted at a bit rate that matches a bit rate or delivery cost requested by a client, reduce bandwidth congestion, and allow clients to request desired bit rates and delivery costs (Vasudevan et al. - Page 2, ¶ [0010]).

12. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0047899 A1 (Son et al.), and further in view of US 2002/0131496 A1 (Vasudevan et al.).

As to Claim 15, Son et al. disclose an invention substantially as claimed, including an MPEG-4 live unicast video streaming system comprising:

an MPEG-4 encoder (Son et al. - Page 2, ¶ [0022] recites MPEG-4 encoding) encoding an information signal into MPEG-4 data composed of successive GOVs at an adjustable encoding bitrate and outputting the GOVs, and adjusting the encoding bitrate in accordance with a bitrate control signal (Son et al. – Page 3, ¶ [0032] recites variable bit rate sent by server to client);

a streaming server receiving the GOVs from the MPEG-4 encoder (Son et al. – Figure 1, item 102 recites the streaming server);

first means provided in the streaming server for changing each received GOV into packets (Son et al. – Figure 1, item 144);

second means provided in the streaming server for wirelessly transmitting the packets generated by the first means (Son et al. – Figure 5B, items 516 and 526 recite server transmission to client; Page 7, ¶ [0072] recites "computer," which one of ordinary skill in the art at the time the invention was made would recognize to include wireless devices such as laptops using wifi or bluetooth);

a client wirelessly receiving the packets from the streaming server (Son et al. – Figure 5B, items 516 and 526 recite server transmission to client; Page 7, ¶ [0072] recites "computer," which one of ordinary skill in the art at the time the invention was made would recognize to include wireless devices such as laptops using wifi or bluetooth);

third means provided in the client for changing the received packets into each recovered GOV (Son et al. – Figure 5B, items 524 and 534);

a buffer memory provided in the client for temporarily storing recovered GOVs generated by the third means (Son et al. – Figure 1 item 152); and

fourth means for reading out each GOV from the buffer memory (Son et al. – Figure 1 item 152 recites buffer; Figure 5B items 520 and 530 recite extracting the stream data).

Son et al. do not explicitly disclose, but Vasudevan et al. disclose an invention substantially as claimed, including

fifth means for calculating a remaining playback time corresponding to GOVs in the buffer memory which have not yet been read out by the fourth means (Vasudevan et al. – Page 6, ¶ [0050-0057] recite the calculation of playback based on buffer);

sixth means provided in the client for generating the bitrate control signal in response to the remaining playback time calculated by the fifth means (Vasudevan et al. – Page 2, ¶ [0011] recites receiving a client input indicative of a desired bitrate, said desired bitrate based on the aforementioned calculation);

seventh means for wirelessly transmitting the bitrate control signal generated by the sixth means to the streaming server (Vasudevan et al. – Page 2, ¶ [0011] recites receiving a client input indicative of a desired bitrate; Page 5, ¶ [0045] recites wireless communication); and

eighth means for transmitting the bitrate control signal from the streaming server to the MPEG-4 encoder (Vasudevan et al. – Page 2, ¶ [0011] recites transcoding to provide a transcoded MPEG data stream).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine a means for calculating a remaining playback time corresponding to GOVs in the buffer memory which have not yet been read out by the fourth means; a means provided in the client for generating the bitrate control signal in response to the remaining playback time calculated by the fifth means; a means for wirelessly transmitting the bitrate control signal generated by the sixth means to the streaming server; and a means for transmitting the bitrate control signal from the streaming server to the MPEG-4 encoder taught by Vasudevan et al., with the quality in content reduction taught by Son et al.

One of ordinary skill in the art at the time the invention was made would have been motivated to provide a system and method to adaptively transcode predictive coded video data and associated audio data such that the data may be transmitted at a bit rate that matches a bit rate or delivery cost requested by a client, reduce bandwidth congestion, and allow clients to request desired bit rates and delivery costs (Vasudevan et al. - Page 2, ¶ [0010]).

As to Claim 16, the combination of Son et al. and Vasudevan et al. discloses an invention substantially as claimed, including an MPEG-4 live unicast video streaming system as recited in 15,

wherein the fourth means comprises an MPEG-4 decoder decoding each GOV read out from the buffer memory into a corresponding portion of an original information signal (Son et al. – Figure 1, item 144 recites the packet processor for decoding MPEG-4).

As to Claim 17, the combination of Son et al. and Vasudevan et al. discloses an invention substantially as claimed, including an MPEG-4 live unicast video streaming system as recited in 15, further comprising:

ninth means for deciding whether or not each GOV in the buffer memory is short of data and requires absent data (Son et al. – Page 5, ¶ [0053] recites the error detection of GOV data);

tenth means for, when the ninth means decides that a GOV in the buffer memory is short of data and requires absent data, generating a retransmission packet loaded with the absent data in the streaming server (Son et al. – Page 5, ¶ [0053] recites the error detection of GOV data and retransmission of missing data);

eleventh means for wirelessly transmitting the retransmission packet from the streaming server to the client (Son et al. – Page 5, ¶ [0053] recites the error detection of GOV data and retransmission of missing data; Page 7, ¶ [0072] recites “computer,” which one of ordinary skill in the art at the time the invention was made would recognize to include wireless devices such as laptops using wifi or bluetooth);

twelfth means provided in the client for extracting the absent data from the retransmission packet (Son et al. – Page 5, ¶ [0053] recites the error detection of GOV data and retransmission of missing data. The client extracts the data sent); and

thirteenth means provided in the client for inserting the absent data extracted by the twelfth means into the data-short GOV in the buffer memory (Son et al. – Page 5, ¶ [0053] recites the error detection of GOV data and retransmission of missing data. The client buffers the data sent – Fig 1, item 152).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These include:

- US 2004/0031056 A1 - Method and system for delivering service provider content to subscribers.
- US 2002/0190876 A1 - Distributed on-demand media transcoding system and method.
- US 6,490,320 B1 – Adaptable bitstream video delivery system.
- US 7,110,452 B2 – Systems and methods for detecting scene changes in a video data stream.
- US 2002/0118752 A1 – Moving picture encoding system.
- US 2002/0019967 A1 – Communication system, transmitter, method of protection against transmission errors.

- US 2002/0170053 A1 – ECM and EMM distribution for multimedia multicast content.
- US 7,146,615 B1 - System for fast development of interactive applications.
- US 7,072,574 B2 - Method and apparatus for recording and playing back moving picture data.
- US 2003/0063806 A1 - Systems and methods for reducing error propagation in a video data stream.
- US 2004/0073953 A1 – Audio/video apparatus for use with a cable television network.
- US 2003/0012376 A1 – Encoding devices for scalable data streaming.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard G. Keehn whose telephone number is 571-270-5007. The examiner can normally be reached on Monday through Thursday, 8:30am - 7:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on 571-272-3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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